JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1981, 14, 131-140 NUMBER 2 (SUMMER 1981)

TOWARD A METHODOLOGY OF WITHDRAWAL DESIGNS FOR THE ASSESSMENT OF RESPONSE MAINTENANCE

FRANK R. RUSCH AND ALAN E. KAZDIN

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN AND
UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE,
DEPARTMENT OF PSYCHIATRY

Single-case experimental designs have advanced considerably in the evaluation of functional relationships between interventions and behavior change. The systematic investigation of response maintenance once intervention effects have been demonstrated has, however, received relatively little attention. The lack of research on maintenance may stem in part from the paucity of design options that systematically evaluate factors that contribute to maintenance. The present paper discusses three design options potentially useful for the investigation of response maintenance. These include: (a) the sequential-withdrawal, (b) the partial-withdrawal, and (c) the partial-sequential withdrawal designs. Each design is illustrated and potential limitations are discussed.

DESCRIPTORS: sequential-withdrawal design, partial-withdrawal design, partial-sequential withdrawal design, maintenance

---

Discussion of strategies for evaluating behavior change in single-case applied research has increased greatly since Baer, Wolf, and Risley (1968) described the use of reversal or multiple-baseline designs. Multiple-schedule (Ulman & Sulzer-Azaroff, 1975), changing-criterion (Hartmann & Hall, 1976), simultaneous-treatment (Barlow & Hayes, 1979; Kazdin & Hartmann, 1978), multiple-probe (Horner & Baer, 1978), and other design variations have been proposed as adjuncts to the more commonly employed reversal and multiple-baseline designs. Each of these designs is directed toward evaluating behavior change. Experimental designs for assessing response maintenance, however, have not been evident in the literature. Because of the need to develop durable changes in behavior, design variations suited to the study of maintenance are extremely important. The present paper suggests several design options for evaluating response maintenance *after* experimental control has been adequately addressed.

Acquisition Versus Maintenance

Problems associated with the assessment of behavior change and the evaluation of response maintenance are interrelated. In acquisition studies investigators are interested in demonstrating, unequivocally, that a functional relationship exists between treatment and behavioral change. In maintenance studies, on the other hand, investigators attempt to conclude that behavior is maintained after the intervention is withdrawn. The former group of investigators depend upon the ability of the subject to discern and respond to changes in the environment when that environment is altered; the latter group relies upon subject's failure to discriminate between those very same stimuli or, possibly, upon the subject's failure to discriminate

---

Both authors express appreciation to George R. Karlan and Laird W. Heal for their suggestions on earlier drafts of this manuscript. Requests for reprints should be sent to Frank R. Rusch, 188 Education, Bureau of Educational Research, College of Education, University of Illinois, Champaign, Illinois 61820.

among functionally similar stimulus, e.g., a different teacher providing the same instruction. If the investigator is evaluating acquisition or maintenance, he or she should be able to conclude which variables are responsible for behavior change or maintenance.

Over the past decade the *Journal of Applied Behavior Analysis* (*JABA*) has published several articles that have addressed the maintenance issue through the inclusion of follow-up measures (Aragona, Cassady, & Drabman, 1975; Greenwood, Hops, Delquadri, & Guild, 1974). These efforts have relied heavily upon "the hope that therapeutically modified behavior will come under the control of and be maintained by natural contingencies" (Hartmann & Atkinson, 1973, p. 589). *JABA* has also included a number of studies that have sought to maintain behavior directly through the manipulation of externally generated cues (Connis, 1979; Hundert & Bucher, 1978; Rusch, Close, Hops, & Agosta, 1976; Sowers, Rusch, Connis, & Cummings, 1980). Several investigations have also been undertaken whereby the subject is taught to self-generate cues that will produce immediate and lasting change (see Israel, 1978; O'Leary & Dubey, 1979; Rosenbaum & Drabman, 1979; Karlan & Rusch, Note 1, for a more complete discussion of this topic).

The present paper introduces a design methodology to evaluate response maintenance when treatment is introduced by the investigator interested in studying treatment programs that maintain behavioral change. This paper begins by introducing design methodology that allows for the sequential withdrawal of components of treatment in order to decrease the probability that subjects will discriminate removal of contingencies. (The term withdrawal is used here to refer to maintenance efforts versus reversal which traditionally is associated with assessing experimental control.) The paper continues with a discussion of methodology that incorporates withdrawing treatment from one or more baselines in an investigation. Finally, a design methodology that combines both strategies is outlined.

Sequential-Withdrawal Design

In the *sequential-withdrawal design,* one component of a multiple-component treatment is withdrawn initially, then a second, and so on, until all components have been withdrawn. That is, each component is withdrawn sequentially in consecutive experimental phases. This particular design has been reported by investigators using the multiple-baseline (Sowers et al., 1980) and reversal designs (O'Brien, Bugle, & Azrin, 1972; Rusch, Connis, & Sowers, 1979). For example, Sowers et al. (1980) modified the time management behavior of three mentally retarded adults by introducing, in a multiple-baseline design, a three-component treatment package consisting of pre-instruction, instructional feedback, and a time card following baseline measures. Following acquisition training the treatment components were withdrawn beginning with withdrawal of pre-instruction followed by instructional feedback. A time card displaying clock faces with break and lunch times was not withdrawn. Results showed that the three-component treatment was effective, when introduced, in producing accurate time management responses during breaks and lunches. The sequential withdrawals—withdrawal of pre-instruction followed by feedback—did not result in any loss of treatment gains. Finally, allowing each employee continued use of the time card resulted in their continuing to go to and from their breaks and lunches, respectively. Thus, behavior was maintained via the sequential withdrawal of one treatment component per experimental phase, after the three-component treatment was shown to be effective in producing time management.

O'Brien et al. (1972) trained a profoundly retarded child to eat with a spoon through the combined use of manual guidance and an interruption-extinction procedure whereby the experimenter prevented eating by removing food from the child's hand. The guidance procedure required the experimenter to guide the proper hand-spoon movements manually. Initially, the use of a reversal design suggested that interruption-extinction was not sufficient to *produce* desired eating. The sequence of procedures tried by O'Brien et al. (1972) is depicted in Table 1. Following return to baseline, manual guidance training procedures were introduced which resulted in increased feeding. Interruption-extinction was then added to the manual guidance procedure which resulted in increases in unassisted feeding. The last three phases, baseline, interruption-extinction, and baseline, showed that eating was maintained (baseline phases) without the interruption-extinction procedure. Combining manual guidance and interruption-extinction allowed O'Brien et al. (1972) to withdraw the manual guidance component but only after both training procedures had been introduced together. The combined training procedures resulted in appropriate eating which required no experimenter intervention, i.e., experimenters did not have to guide eating manually. Increased independent eating, in turn, allowed O'Brien et al. (1972) to return to baseline followed by interruption-extinction and a final baseline phase. Withdrawing each of the two treatment components, one at a time, appeared to have either resulted in the resident's failure to discriminate between absence or presence of stimuli being manipulated by the investigators or, more likely, the resident's failure to rely on assistance once eating was acquired.

Table 1

The sequence of experimental procedures for O'Brien et al. (1972) and Rusch et al. (1979).

O'Brien et al. (*1972*)	*Rusch et al.* (*1979*)
1. Baseline	1. Prompts plus Praise
2. Interruption-Extinction	2. Prompts, Praise plus Tokens
3. Baseline	3. Prompts plus Praise
4. Manual Guidance	4. Prompts, Praise plus Tokens
5. Manual Guidance and Interruption-Extinction	5. Prompts, Praise, Tokens plus Response Cost
6. Baseline	6. Prompts, Praise plus Tokens
7. Interruption-Extinction	7. Prompts, Praise, Tokens plus Response Cost
8. Baseline	8. Prompts, Praise, Tokens plus Variable Response Cost
	9. Fade Exchange Ratio
	10. Fade Chalk Board
	11. Fade Weekly Paycheck
	12. Fade Program Store
	13. Fade Prompts plus Praise
	14. Follow-up

Rusch et al. (1979) sequentially withdrew treatment components after assessing the combined effects of praise, tokens, and response cost on increasing a single adult's time spent working in a restaurant setting in an ABABCBC design (see Table 1). The investigators initially wished to determine the effects of using prompts and contingent praise (A), prompts and praise plus tokens (B), and, finally, prompts, praise and tokens plus response cost (C) upon work output. Prompts, praise, tokens plus response cost were shown to increase the percentage of time on task. The investigators' interest then switched to maintaining the treatment gains. Therefore, single components of the treatment were sequential-withdrawn. Initially, a cost-intervention phase was instituted during which the subject received the cost contingency on predetermined, randomly selected days. This phase was followed by a 4-step withdrawal of the token economy, including: (1) fading the exchange ratio from twice a day to once a day, (2) eliminating a chalk board that displayed the points earned, (3) further extending the exchange ratio to once a week, (4) replacing, with a paycheck, the secondary reinforcers used for exchange of items in the program store. In a final phase, praise was withdrawn. These withdrawals constituted a sequential-withdrawal design (see Table 1). Data collected during each of these phases indicated no less in acquired behavior.

Design limitations and considerations. Two limitations central to the use of the sequential-withdrawal design deserve consideration. First, studies such as Sowers et al. (1980), O'Brien et al. (1972), and Rusch et al. (1979) provide no demonstration that the sequential-withdrawal method was necessary for response maintenance. It is quite possible that each individual's behavior in the Sowers et al. (1980) study and the Rusch et al. (1979) study may have been maintained with a complete withdrawal, i.e., a complete withdrawal of all components following acquisition training.

The major limitation of the O'Brien et al. (1972) as well as the Rusch et al. (1979) studies was the decision to use one treatment versus another to maintain behavior after acquisition training. As noted in Table 1, following the combined manual guidance and interruption-extinction and the third return to baseline the interruption-extinction procedure was retained in favor of the manual guidance procedure in the O'Brien et al. study. It is feasible that manual guidance, alone, could have maintained feeding just as well as or better than the procedure that relied upon correcting mistakes after feeding began. In this study manual guidance was faded when the chain of responses was completed correctly on three successive assisted trials. The desired responses probably would have come under the discriminative control of succeeding stimuli as the child acquired the spoon feeding procedure. Marholin and Steinman (1977) used a similar "probing" procedure across sessions in their attempt to establish stimulus control in a classroom setting. Similarly, Rusch et al. (1979) could have withdrawn any one of several components following the second prompts, praise, tokens plus response cost phase.

Finally, it is important to distinguish between fading and withdrawing components. In the Rusch et al. (1979) investigation, response cost and tokens were withdrawn gradually (fading) whereas praise was withdrawn abruptly. Fading was incorporated across major components of the token economy. The removal of the token component itself constituted a withdrawal. It is possible to remove a component abruptly or to fade a component; however, either way the component has been withdrawn. In the case where there is more than one component, sequential withdrawals are used which also may involve abruptly withdrawing or fading each component.

Partial-Withdrawal Design

The *partial-withdrawal design* consists of withdrawing one component of a treatment or the complete treatment from one of several baselines in a multiple-baseline design across persons, behaviors, or situations. Studies by Russo and Koegel (1977) and Vogelsburg and Rusch (1979) illustrate the use of the partial-withdrawal design. Russo and Koegel (1977) reported on the feasibility of using behavioral techniques to integrate an autistic child into a regular public-school classroom. A multiple baseline across three behaviors showed that the behavioral techniques applied by a therapist were sufficient to produce increases in social behavior and appropriate responding and to inhibit self-stimulation. Russo and Koegel (1977) also incorporated a return-to-baseline condition for one of the treated responses, social behavior. From the viewpoint of Hartmann and Atkinson (1973) this return to baseline implied that the other two behaviors would not have maintained had similar reversals been used. From a different perspective, this demonstration provided the necessary evidence to suggest that efforts to maintain treatment gains would need to be programmed. In the Russo and Koegel (1977) study, a teacher was then trained by the therapist to administer the treatment which resulted in the teacher maintaining the target behaviors.

Vogelsberg and Rusch (1979) incorporated the partial-withdrawal into a multiple-baseline design when training three severely handicapped adolescents to cross partially controlled intersections. Each adolescent received instructions, feedback, and selective repeated practice in order to acquire approach, looking, stepping, and walking skills. These skills included walking to and stopping at the curb; looking behind, in front, left and right, waiting if cars were coming and then repeating the looking sequence; stepping off the curb; and walking across the street and stepping up on the opposite curb necessary to cross the street. Results indicated that the combination of instructions, feedback, and practice developed the criterion behaviors.

A partial-withdrawal was tried with one individual (Subject A) by eliminating feedback; when the student failed to make an appropriate response, corrective feedback was not provided. Figure 1 represents this portion of the plotted results from Vogelsberg and Rusch (1979). For three days, the partial-withdrawal suggested that when feedback was removed approaching, stepping, and walking were maintained. However, looking decreased in frequency. These data suggested that a loss of looking in all subjects might result if similar partial-withdrawals were introduced. Therefore, these investigators instituted a totally separate treatment—behavioral rehearsal and a trainer model for each of the two remaining students—which resulted in the criterion behaviors being maintained. This second treatment was also applied to Subject A after successfully rebuilding the lost looking skills, and resulted in similar maintenance.

A partial-withdrawal design was used by Vogelsberg and Rusch (1979) to evaluate the combined effects of instructions and selective feedback in acquiring complex street crossing skills. Data suggested that the initial treatment, consisting of instructions, feedback, and practice, developed the desired behavior change. A second and equally important goal, however, was to maintain the newly acquired behaviors. Rather than withdrawing all treatment components from all three students, a partial-withdrawal was tried with one. The results of the

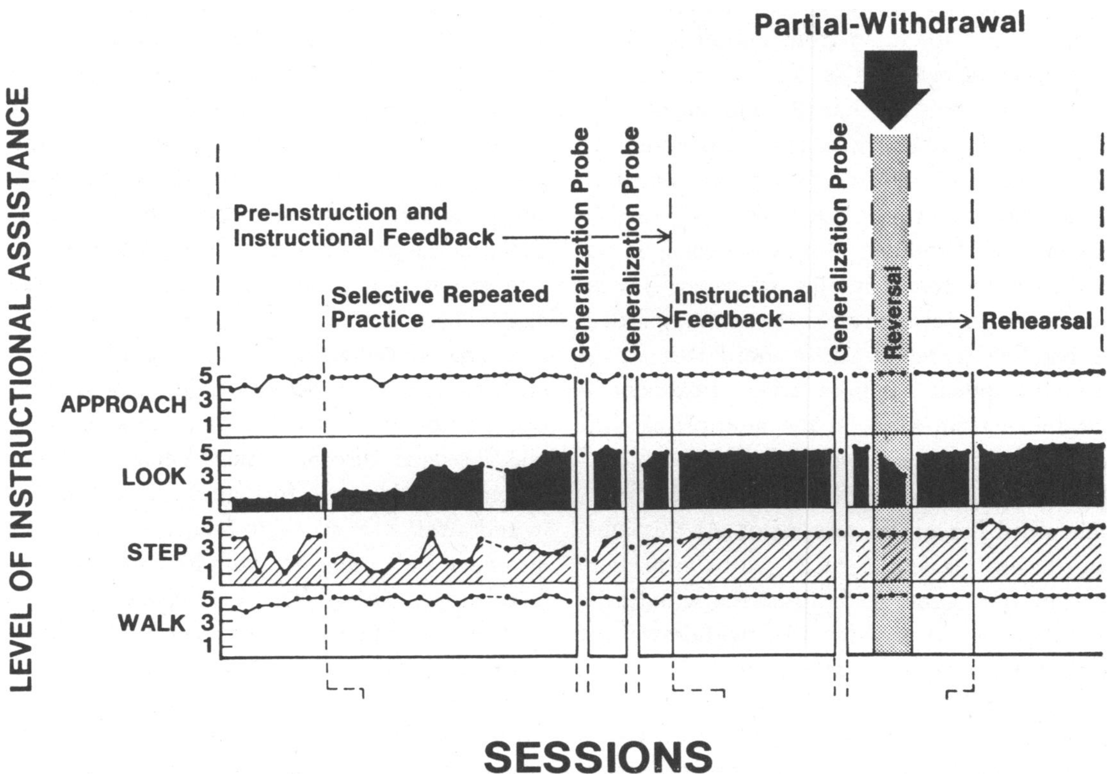

Fig. 1. The level of instructional assistance required by Subject A to cross partially-controlled intersections. The four behavioral clusters (approach, look, step, walk) were acquired before a partial-withdrawal (indicated by the bold arrow), constituting a complete withdrawal of the treatment package was introduced. *Note.* Adapted from Vogelsberg, R. T., & Rusch, F. R., reprinted by permission.

partial-withdrawal suggested that total withdrawal might ultimately result in loss of similar skills for all students.

Design limitations and considerations. In a multiple-baseline design, a partial-withdrawal consists of withdrawing part of the intervention or the entire intervention from one of the baselines following demonstrable behavior change. Because the effects of withdrawing treatment are not known in advance, the partial-withdrawal provides a preview of what is likely to happen across each of the baselines if treatment were similarly withdrawn. The information obtained from an initial partial-withdrawal, however, must be viewed cautiously. The possibility exists that the information obtained from partially withdrawing treatment or withdrawing a component of treatment may not represent the characteristic data pattern for all subjects, behaviors, or situations included in the design.

For example, if treatment or a component of treatment is withdrawn from one of the baselines and performance is maintained for this baseline, it is possible that the component withdrawn is not the component contributing to maintenance or is not the component contributing to maintenance for the subjects represented by the other baselines. Simply stated, it is not necessarily the case that, after treatment is withdrawn, the performance pattern on any particular baseline represents the pattern that would occur for other baselines when treatment is withdrawn from them. If the multiple-baseline design across subjects were used, it is conceivable that performance of one subject would be maintained but others would not. At this juncture the investigator is faced with the primary question of whether to replicate the withdrawal procedure or to advance the withdrawal by eliminating a second component in the second or third baseline or by eliminating the entire collection of components. When withdrawal of a single component results in loss of performance then a different component could be withdrawn once the original component is reinstated and behavior, once again, established.

The Partial-Sequential Withdrawal Design

The ***partial-sequential withdrawal design*** consists of withdrawing an entire multiple-component treatment, or part of that treatment, from one of the baselines in a multiple baseline and assessing the effect of the partial-withdrawal. Then, if withdrawal results in loss of treatment gains, rather than supplanting the original treatment with a second treatment as tried by Russo and Koegel (1977) and Vogelsberg and Rusch (1979), sequential-withdrawals would be employed in the other baselines. Combining the partial- and sequential-withdrawal designs allows for the orderly withdrawal of the various components of the treatment in an effort to decrease the probability that subjects will discriminate the absence or presence of the contingencies. By combining the partial- and sequential-withdrawal design strategies investigators can predict, with increasing probability, the extent to which they are controlling the treatment environment as the progression of withdrawals is extended to other behaviors, subjects, or settings.

Figure 2 represents three hypothetical investigations employing the partial-sequential withdrawal design in investigations using multiple-baseline designs. In Figure 2(a), the treatment consists of prompts and praise. The two components are introduced to Subject 1 and Subject 2 in time-lagged fashion with replicable changes in behavior. After demonstrating that prompts and praise are effective in changing behavior in the intended direction, maintenance of these changes is addressed. In Figure 2(a) a complete withdrawal is tried with Subject 1, i.e., both prompts and praise are withdrawn (see Figure 2(a), upper panel). This withdrawal results in loss of performance and suggests that a similar withdrawal applied to Subject 2 might result in similar losses. Therefore, only prompts are withdrawn for Subject 2. Once it is shown that praise alone continues to maintain behavior, praise itself is withdrawn. In this example, praise is discontinued following withdrawing prompts, representing a sequential-withdrawal.

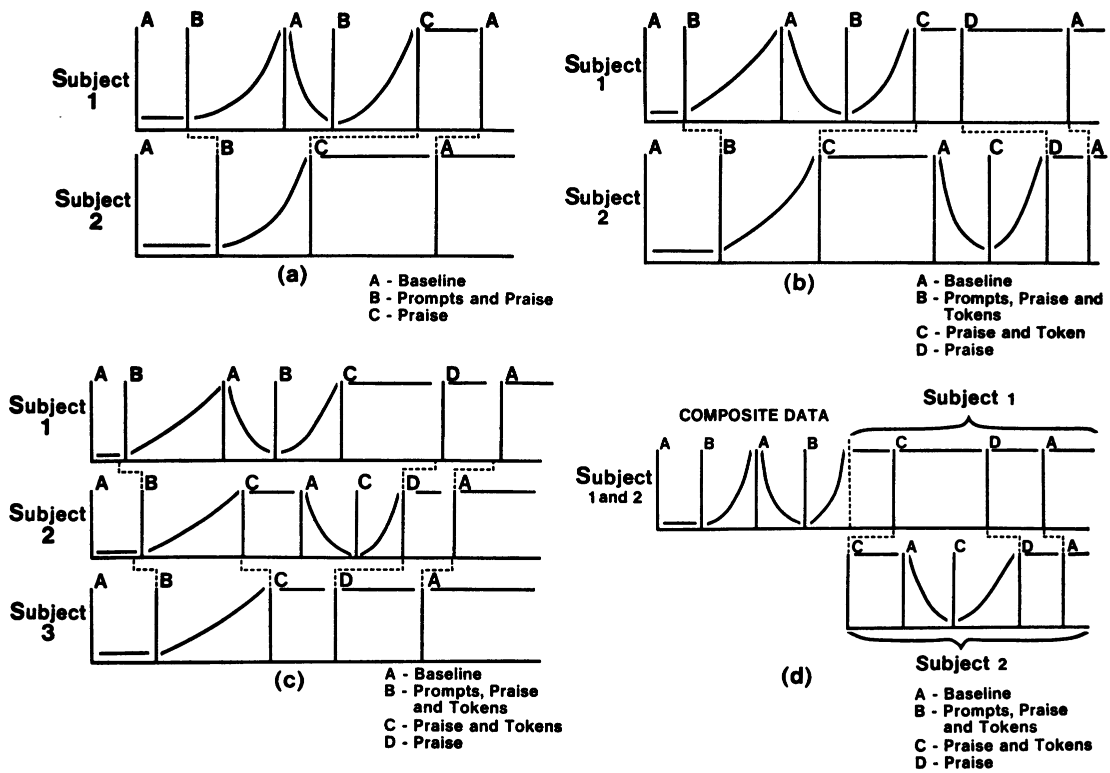

Fig. 2. A systematic withdrawal of a two-component treatment across two subjects is represented in the upper left graph (a). Withdrawal of a three-component treatment across two subjects is indicated in the upper right graph (b). A systematic withdrawal of a three-component treatment across three subjects is shown in the lower left portion of the figure (c). Finally, withdrawal of a three-component treatment across two subjects within an ABAB reversal is depicted in the lower right portion (d).

This sequential-withdrawal is also used with Subject 1 after performance is reestablished in a second treatment phase.

Figure 2(b) and 2(c) illustrates the partial-sequential withdrawal design applied to a three-component treatment with two and three subjects, respectively. Both cases assess the effects of withdrawing the entire treatment from one subject (partial withdrawal) after treatment effectiveness had been demonstrated (see upper panel of both figures). Although the possibility of maintenance of performance gains following the total withdrawal of treatment is possible, these two multiple-baseline demonstrations indicate that such abrupt withdrawals result in rapid and total losses of performance.

Partial-sequential withdrawals would be expected to produce less performance loss. Inspection of Figure 2(b), upper panel, indicates that withdrawing prompts, praise, and tokens results in loss of performance; therefore, simultaneous to reinstating the three component package for Subject 1, a single component, prompts are withdrawn from Subject 2 and indicate that praise and tokens maintain performance (third phase, lower panel). During the second partial-withdrawal (second return to Baseline), Subject 2 also appears to discriminate between the presence and absence of the two remaining treatment components. Therefore, following reinstatement of the performance of Subject 2, tokens are withdrawn from Subject 1 (phase D). Again, praise appears to maintain Subject 1's performance, suggesting that tokens, only, be withdrawn from Subject 2.

It is unnecessary to implement all partial-withdrawals with one subject when two or more subjects are available, as is the case in both hypothetical investigations illustrated in Figure 2(a) and 2(b). It is quite possible to expedite maintenance by introducing partial-withdrawals to a second or third subject as shown in Figure 2(c). Once a partial-withdrawal indicates that withdrawal of treatment components will result in loss of performance, performance will need to be reestablished. Reestablishing the performance of one subject may require several experimental sessions. Therefore, when time is limited, additional partial-withdrawals should be applied to a second or third subject. Further, the demonstrated ability of a subject to discriminate the presence or absence of treatment undermines the purpose of traditional multiple-baseline and reversal designs. In addition, performing several partial-withdrawals with the same subject may increase the likelihood that a subject will discriminate the presence or absence of treatment. With this in mind, partial-withdrawals would most appropriately be applied across subjects, settings, or behaviors.

Thus far, discussion has focused on the use of a partial-sequential withdrawal design when investigators employ the multiple-baseline design. Investigators using a reversal design to assess treatment effects on two or more subjects may also utilize a partial-sequential withdrawal design. If the composite data from two or more subjects comprise a single dependent measure, investigators could withdraw treatment from one subject while leaving the treatment intact with the remaining subject(s). More specifically, data would be collected on two or more subjects throughout the ABAB phases of the investigation and reported collectively. This would represent the traditional reversal design directed toward assessing experimental control. However, when attention shifts to the maintenance of performance, data collected for all subjects would need to be reported separately. Figure 2(d) presents such a hypothetical design, illustrating data collected and reported from two subjects with the treatment consisting of three components. In the ABAB version of the reversal design, experimental control is attained; the results also demonstrate that withdrawing all components results in total loss of treatment effect. As depicted in the figure, the treatment components are sequentially withdrawn and further partial-withdrawals tried to assess the manner of withdrawal.

Design limitations and considerations. The partial-sequential withdrawal is designed to reveal whether maintenance of treatment effects occur when removing various components of the intervention. The basic method involves sampling: sampling of subjects or behaviors from which some or all components of treatment are withdrawn. Partial- withdrawals of treatment, independent of the specific design variation, provide a preview of what is *likely* to occur when treatment is withdrawn. However, when the preview is accurate is an empirical question. It is possible that the effects of withdrawing treatment interact with a specific baseline, behavior, or subject. Similarly, in a sequential-withdrawal design, one component of a multiple-component treatment may be withdrawn, followed by a second component, and so on. Complexities may exist in this withdrawal strategy as well. For example, it is possible that the order in which various components are withdrawn may dictate the extent to which treatment effects are maintained. For example, if treatment consisted of verbal prompts, manual guidance, and reinforcement, it may make a difference in a sequential-withdrawal design if reinforcing consequences, rather than prompts or guidance, were withdrawn first. Thus, the conclusions reached do not necessarily apply to all the different ways in which treatment components could be withdrawn.

With these considerations in mind the approach taken to withdraw one component over another could be a logical and/or an ethical one. In some cases, it may appear very reasonable to withdraw the most intrusive components first. For example, when using a treatment that consists of prompts, modeling, and physical guidance, physical guidance being the most intrusive would be removed first, followed by the removal of modeling, and then of prompts.

In general, withdrawal designs are directed at studying maintenance by examining how treatment can be withdrawn. It is possible that several aspects of how treatment is withdrawn (e.g., all at once for one subject, one component at a time for all subjects), the particular baselines across which the withdrawals are made (e.g., across behaviors or persons), and the interactions of these factors will dictate whether treatment effects are maintained. The possibility of these influences operating indicates that conclusions reached about a particular withdrawal study do not necessarily apply to all subjects or baselines within the same study or to other studies. The considerations mentioned here should not interfere with utilization of the designs because they point to empirical questions that have yet to be explored. In addition, the issues raised here are not necessarily methodological problems but rather extremely important substantive questions about factors that relate to maintenance. As such, they warrant examination in their own right to determine the manner in which treatments can be terminated to maximize their long-term effects. Aside from the use of the designs proposed here to foster maintenance, withdrawal designs raise important questions about studying alternative withdrawal methods and their relative efficacy in promoting maintenance.

Concluding Comments

This paper introduced several withdrawal design options for use by investigators interested in assessing maintenance of acquired performance after questions of internal validity have been addressed. Following a statement of the problem, this paper reviewed several reported efforts to assess maintenance of performance when treatment was sequentially withdrawn (sequential-withdrawal) or withdrawn from part of a larger investigation (partial-withdrawal). Further, three hypothetical investigations using a multiple-baseline design and one investigation using a reversal design were described suggesting ways to assess maintenance through the partial-sequential withdrawal design. Finally, this paper suggested some limitations and considerations for investigators wishing to further study methods to withdraw treatment components when response maintenance is an important and desired outcome.

REFERENCE NOTE

1. Karlan, G. R., & Rusch, F. R. *Correspondence between saying and doing: Some thoughts on defining correspondence and future directions for applications.* Manuscript submitted for publication, 1981.

REFERENCES

Aragona, T., Cassady, T., & Drabman, R. S. Treating overweight children through parental training and contingency contracting *Journal of Applied Behavior Analysis,* 1975, **8,** 269-278.

Baer, D. M., Wolf, M. M., & Risley, T. R. Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis,* 1968, **1,** 91-97.

Barlow, D. H., & Hayes, S. C. Alternating treatment design: One strategy for comparing the effects of two treatments in a single subject. *Journal of Applied Behavior Analysis,* 1979, **2,** 199-210.

Connis, R. T. The effects of sequential pictorial cues, self-recording, and praise on job task sequencing of retarded adults. *Journal of Applied Behavior Analysis,* 1979, **12,** 355-361.

Greenwood, C. R., Hops, H., Delquadri, J., & Guild, J. Group contingencies for group consequences in classroom management: A further analysis. *Journal of Applied Behavior Analysis,* 1974, **7,** 413-425.

Hartmann, D. P., & Atkinson, C. Having your cake and eating it too: A note on some apparent contradictions between therapeutic achievements and design requirements in $N = 1$ studies. *Behavior Therapy,* 1973, **4,** 589-591.

Hartmann, D. P., & Hall, R. V. The changing criterion design. *Journal of Applied Behavior Analysis,* 1976, **9,** 527-532.

Horner, D. R., & Baer, D. M. Multiple-probe technique: A variation on the multiple baseline. *Journal of Applied Behavior Analysis,* 1978, **1,** 189-196.

Hundert, J., & Bucher, B. Pupils' self-scored arithmetic performance: A practical procedure for maintaining accuracy. *Journal of Applied Behavior Analysis,* 1978, **11**, 304.

Israel, A. C. Some thoughts on correspondence between saying and doing. *Journal of Applied Behavior Analysis,* 1978, **11**, 271-276.

Kazdin, A. E., & Hartmann, D. P. The simultaneous-treatment design. *Behavior Therapy,* 1978, **9**, 912-922.

Marholin, D., & Steinman, W. M. Stimulus control in the classroom as a function of the behavior reinforced. *Journal of Applied Behavior Analysis,* 1977, **10**, 465-478.

O'Brien, F., Bugle, C., & Azrin, N. H. Training and maintaining a retarded child's proper eating. *Journal of Applied Behavior Analysis,* 1972, **5**, 67-72.

O'Leary, S. G., & Dubey, D. R. Applications of self-control procedures by children: A review. *Journal of Applied Behavior Analysis,* 1979, **12**, 449-465.

Rosenbaum, M. S., & Drabman, R. S. Self-control training in the classroom: A review and critique. *Journal of Applied Behavior Analysis,* 1979, **12**, 467-485.

Rusch, F. R., Close, D., Hops, H., & Agosta, J. Overcorrection: Generalization and maintenance. *Journal of Applied Behavior Analysis,* 1976, **9**, 498.

Rusch, F. R., Connis, R. T., & Sowers, J. The modification and maintenance of time spent attending to task using social reinforcement, token reinforcement and response cost in an applied restaurant setting. *Journal of Special Education Technology,* 1979, **2**, 18-26.

Russo, D. C., & Koegel, R. L. A method for integrating an autistic child into a normal public school classroom. *Journal of Applied Behavior Analysis,* 1977, **10**, 579-590.

Sowers, J., Rusch, F. R., Connis, R. T., & Cummings, L. T. Teaching mentally retarded adults to time-manage in a vocational setting. *Journal of Applied Behavior Analysis,* 1980, **13**, 119-128.

Ulman, J. D., & Sulzer-Azaroff, B. Multi-element baseline design in educational research. In E. Ramp & G. Semb (Eds.), *Behavior analysis: Areas of research and application.* Englewood Cliffs, N.J.: Prentice-Hall, 1975.

Vogelsberg, T., & Rusch, F. R. Training three severely handicapped young adults to walk, look and cross uncontrolled intersections, *AAESPH Review,* 1979, **4**, 264-273.

Received March 18, 1980
Final acceptance December 1, 1980